The Ballarat Naturalist

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Estuaries of South-West Victoria presented by Dr John Sherwood, Honorary Associate Professor, Deakin University, Warnambool campus.

In the heart of South-West Victoria, nestled between land and sea, lie the captivating and complex ecosystems known as estuaries. Dr. John Sherwood, Honorary Associate Professor at Deakin University's Warnambool campus, took us on a fascinating journey through these dynamic environments, sharing insights gleaned from decades of exploration and study.

The foundation of Dr. Sherwood's discourse was "Estuaries 101," a primer on these partially enclosed bodies of water where rivers converge with the sea. He emphasised the critical role of salinity, showcasing how it shapes the unique characteristics of each estuary. With over 123 such estuaries in Victoria alone, each with its own story to tell, understanding their nuances becomes imperative for effective management.

Key to this understanding are the defining characteristics of estuaries: their shape, large seasonal inequality in rainfall, small tidal range, and the presence of flood tide deltas at their entrances. Dr. Sherwood explained how the hydrodynamic cycle sustains life within estuaries, emphasising the delicate balance of saltwater and freshwater that is essential to their health.

Amidst the natural beauty of estuaries lies several challenges. Dr. Sherwood underscored the importance of managing environmental flow needs, particularly in the face of changing climate patterns. Without adequate flow, oxygen levels plummet, creating a toxic environment for aquatic life. The dance of the "mixing zone," where salt and freshwater converge, is crucial for species like black bream, whose survival depends on its delicate balance.

Entrance management is a key concern, especially in light of climate change-induced shifts in river flows. With diminishing rainfall, estuary entrances are at risk of closure, leading to devastating consequences for both ecosystems and communities. Dr. Sherwood highlighted the innovative Estuary Entrance Management Support System (EEMSS), offering a glimpse into evidence-based solutions which aid in their preservation.

Furthermore, the downstream impact of human activities cannot be understated. Estuaries, as "receiving waters," are vulnerable to pollutants from upstream which threaten their fragile ecosystems. Dr. Sherwood advocates for sustainable practices, stressing the need for collective action to preserve these invaluable natural treasures.

In conclusion, Dr. John Sherwood's enlightening discourse serves as a poignant reminder of the interconnectedness of land, water, and life. As we grapple with the uncertainties of climate change, the fate of estuaries hangs in the balance. Yet, through diligent stewardship and a shared commitment to conservation, we can ensure these vital ecosystems continue to thrive for generations to come.

Sheree Cartledge

The Hopkins River Warrnambool

Notes on our field trip to Warrnambool – Sunday 4 February 2024

Nine members travelled on a hot day to Warrnambool on an excursion led by member Andy Arnold and (in part), Dr. John Sherwood, Honorary Associate Professor at Deakin University. John had made a presentation on Friday 2 February by zoom on the "Estuaries of South Western Victoria". This presentation is reported on separately in this newsletter. It was in the context of that presentation that we travelled to Warrnambool to see aspects of the estuaries of the Hopkins River and the Merri River.

The primary context of our visit was to learn more about the dynamic nature of that part of the coastline that has been constantly changing for hundreds of thousands of years (and more). Andy Arnold has spent a large part of his professional life in this area and he has extensive knowledge of local geomorphology, settlement and urban history, engineering efforts to alter the coastline to be more "useful" to the local town as it developed, and the impacts of all this on terrestrial and marine ecology.

Hopkins River Estuary

We gathered first at Proudfoot's Historic Boatshed (left) on the Hopkins River where Andy pointed out that the estuary as we see it now is a submerged river valley caused by an historic rise in sea levels causing inundation. In its lower reach The Hopkins River estuary traverses limestone deposits (Tmh and Qp) shown on the geological map for the area having traversed newer volcanic areas (Qb1 and Qb2) further upstream. Andy also suggested that there was evidence supported by the geological map that, in deep time, the Hopkins River path may have formed an alternative outlet to the ocean further to the east towards Childers Cove. Land east and south of the estuary has now been largely alienated by urban settlement with private and exclusive rights to estuary frontage.

The water levels in the estuary are governed by the amount of seasonal catchment flows from further north, and determine whether the sand bar at the mouth is open or forms a physical barrier to flows reaching the sea. There have been occasions when circumstances have combined to raise the level significantly causing inundation of buildings and other assets with estuarine frontage. John Sherwood spoke at length in his talk about the dynamic processes at play affecting levels of salinity and dissolved oxygen, and the impacts on estuarine fish populations in particular.

Hopkins River Mouth—Moyjil (Point Richie)

Moyjil (Point Ritchie)
Next stop was Moyjil (Point Ritchie) at the mouth of the Hopkins River, where John Sherwood took us on a journey through deep time to illustrate the archeological work being undertaken by a professional team in which he has played a key part. A significant context for this work has been knowledge of the glacial and interglacial periods experienced by the earth's climate. In broad terms it seems that there is a period of about 100,000 years between interglacial events and that, currently we are in such an interglacial period. This is characterized by historically high sea levels and unstable coastal frontages.

The purpose of the archeological study has been to collect information on observations of the geological layers laid down over time in what is now the exposed coastal edge. These observations have been made on eroding sea stacks at Moyjil and nearby sand dunes. The observations have led to interpretations by the team that support a hypothesis that there might have been a human presence in the area as far back as 100,000 – 120,000 years ago. This would be ground-breaking if proved because it would be evidence that nearly doubles the period of human presence in Australia.

One of the two eroded sea stacks at Moyjil with Lady Bay behind

Early Human Presence evidence

The observations that support this idea can be summarized:

- There are layers of geological deposits that can be readily observed and dated to provide benchmarks in time. These involve compacted deposits of biogenic sand, limestone, and ash from volcanic activity in the area.
- There are extensive shell deposits which appear to consist of primarily one marine shellfish species – commonly called Turbo (*Lunella undulatum*). This species is an edible shell-fish with an operculum which blocks the entrance to the shell when the creature retreats into it. A narrow size range has been observed for both the shells and the operculum which can be radio dated. The size range suggests that the shell deposit was not a random event caused by wave activity or other natural processes.
- Much of the shell deposits consist of fragments which appear to have been deliberately broken in a particular manner, supporting the idea of an intelligent use of stone to open the shell to retrieve its contents.
- There have been observations such as blackened stones, suggesting the intelligent use of fire.
- In other deposits there are shells from freshwater shellfish species suggesting the primary species harvested was from a time during the glacial period when the sea level was much

lower, the coastline was further out, the river channel extended much further south, and the location of the shell deposit was inland and adjacent to fresh water.

According to John Sherwood, for the archeological record to fully support a human presence extending back to 100,000 years or more, the "smoking gun" would have to be found in contemporary deposits. This means the presence of human bones and/or confirmed tools. Until this happens, then, an exciting theory cannot be confirmed. Of course, they have also considered other theories that support the observations such as asking the question as to whether wave action or wildlife such as birds could be involved. Wave action has been discounted because shell fragments would be rounded and worn, rather than sharp as observed. The investigation continues.

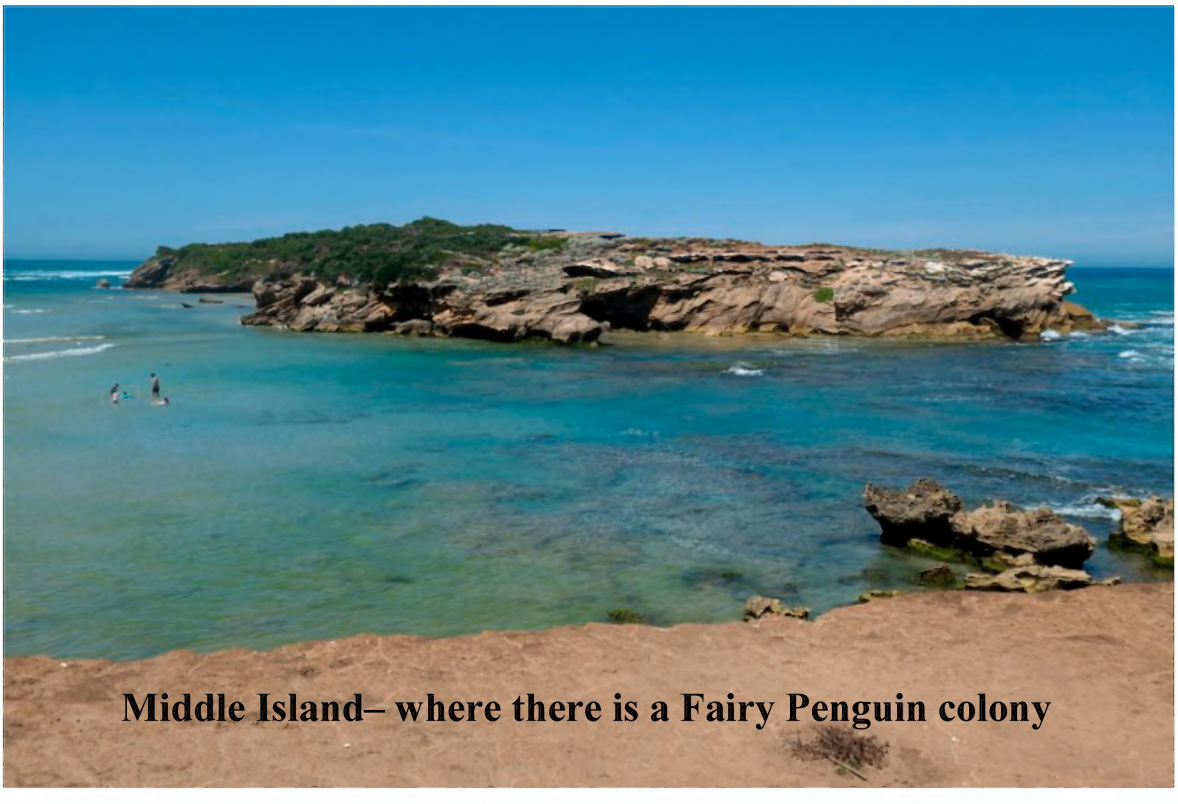
John Sherwood tutoring our group at Moyjil

Point Pickering

The group then moved on to the mouth of the Merri River where Andy Arnold shared his knowledge of the geomorphology of the area and how it has been affected by the settlement of urban Warrnambool. We walked to Point Pickering and observed very successful revegetation of the area with coastal species. This area

had previously suffered badly through vegetation loss and removal over time. Andy was directly involved in these works.

In the early days of Warrnambool, port activities were conducted via tender vessels because ships had to anchor off-shore. Eventually it was deemed that greater protection for shipping was needed and a breakwater was proposed and built, anchored to a rocky reef area near Middle Island in the Merri Marine Sanctuary.



Middle Island– where there is a Fairy Penguin colony

With the further building of a viaduct or causeway to link the mainland to the breakwater, Warrnambool Harbour (Lady Bay) was created and protection for shipping vastly improved. However, despite expert advice to the contrary, the construction of the causeway ended up totally blocking the dynamic movement of the tidal activity from the Merri Sanctuary area through to the Lady Bay area. These developments changed the dynamic and natural movement of coastal sands, so that the result has been a massive silting up of Lady Bay with sand.

Andy pointed out how the Merri River was changed and an artificial channel created which has intersected with an early channel from Lake Pertobe called Pertobe Creek. Lake Pertobe had originally been partially connected by high tides with Lady Bay, but now is totally disconnected because of the foreshore build-up of sand deposits. He showed us the locations of the tramway and the rail line that

provided a connection with the breakwater, and was also involved in constructing the causeway.

Merri River canal—right and the estuary and salt marsh on the left

Merri River at Dennington
We stopped off at Dennington to observe that the Merri River was still estuarine at this point. There was little birdlife to be observed here but the following species were observed in very small numbers: Chestnut Teal; White Egret; Little Pied Cormorant; Pelican; Magpie; Ibis
This was a section of the Merri River commonly used for recreation, particularly rowing and more passive activities.

Wollaston Bridge
Final stop was the Wollaston Bridge, an historic restored suspension bridge over the Merri River north of Warrnambool. Andy Arnold related his knowledge of the history of the bridge which is now a tourist attraction for Warrnambool. We then departed from the tour.

Because of time constraints we were not able to visit Tower Hill or the Belfast Coastal Reserve.

A huge thankyou is extended to both Andy Arnold (who was proudly in one of his old stamping grounds) and to Dr. John Sherwood

(an expert in many things including his own backyard of Warrnambool). The amount of knowledge these two have is astounding, as is their ability to share it.

Neville Oddie February 2024
Images Andy A, Val H & Margaret R

Wollaston Bridge

Beside the Merri River at Dennington
Andy A is in front of a sign featuring a poem and photos commemorating the great flood of 1946

Atlas of Living Aust reposted

BHL Australia
@bhl_au

We've made a tremendous start on our @PRO_Vic-funded "Capturing the history of Victoria's Field Naturalists" project. Thus far, we've made 4000+ pgs freely available on @biodivlibrary from the publications of the Ballarat, Castlemaine & Peninsula Field Naturalists Clubs.

APRIL 1993 Club of Ballarat Incorporated.

EXCURSION - NEWS SHEET

Meeting	April 2	"The Eyes Have It" -Dr K.McDonnell
Meeting	May 7	Arboreal Fauna of the Maryborough District - Mr R.Trainor
Excursion	April 4	Pomporneit Area - Mr L.Fink
Excursion	May 9	Creswick Nursery and Land Care Trail

Castlemaine Field Naturalists Club Inc.

Fomitopsis lilacinogilva - Lilac Shelf Fungus at Bullarto Reservoir - photo Noel Young

New Zealand - February 2015
Joy Weatherill

In February, I spent three weeks touring and walking in New Zealand, and my outstanding impression is of a country which is pristine and beautiful; but at the same time, fragile - formed by earth's movements and carved out by glaciers.

We worked our way south from Auckland, seeing boiling mud and erupting geysers around Rotorua; and the steaming crater of Mt Tongariro in the Tongariro National Park, (Walkers were required to sign a form and state next of kin!) The leader who had walked the Tongariro Crossing about a month before noted that there was more steam coming from the crater than previously.

And finally to Christchurch. I couldn't believe that four years after their earthquake, there would still be such a scene of destruction - vacant areas where buildings had once stood, other buildings boarded up, and the

1:16 PM · Feb 5, 2024 · **877** Views

Nicole Kearney from the Biodiversity Heritage library has agreed to be our guest speaker in May

Items for Our Club Newsletter

We encourage many of our members throughout the year to volunteer to write up accounts of our guest speakers' presentations and/ or things we discovered on our monthly field trips, and send them to our Editor/s within 2 weeks.
Photos are also welcome, but please send in a small size.
Other smaller items to part fill pages are also welcome– eg a book review or other items of interest to Field Nats.

April Newsletter As Val will be away from 26th Mar, please send March write ups as early as possible to her or to Vireya from 24th Mar who will complete that Newsletter ..
Vireya Jacquard <vireya@gmail.com>

A summary of the FNCB Meeting Minutes Feb 2nd 2024
7.30pm, Held in person and via Zoom

Attendance: President Margaret Rich acknowledged the traditional custodians of our land before welcoming 20 members and one visitor attending in person and five members and one visitor (John Sherwood) attending via Zoom.
Apologies: C. Hall, P. & C. Dalman, John Petheram and Andrew Grant.

Guest Speaker: Andrew Arnold introduced our guest speaker, Dr John Sherwood, Honorary Associate Professor, Deakin University, who gave us a fascinating presentation on "Estuaries of South-west Victoria". Sheree kindly volunteered to write-up this presentation for the March newsletter.

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Business Arising from Correspondence:

- The Committee accepted two new members to the Club in January: Alasdair Wardle and Sue Grey-Smith. Please give them a warm welcome and introduce yourselves to them when you get a chance.

- Fun Fungi Ecology is working on a guide to the fungi and mushrooms of the Kulin Nation and is seeking pre-orders from groups. The FNCB will pre-order 100 copies for subsequent re-sale to members and others when available.

- Many of our Club's newsletters (*The Ballarat Naturalist*) from 1974 to 2011 are now available on the Biodiversity Heritage Library and the remainder up to 2023 should be uploaded and available by the end of February:
https://www.biodiversitylibrary.org/bibliography/207229

Reports:

Treasurer's Report

Opening bal. as at Dec. 1, 2023: $8,663.55
Income $69.39
Expenses: $82.00
Closing bal.: $8,650.94

Motion: that the Treasurer's Report be accepted & tabled invoices be approved for payment. Approved

Update on FNCB's iNaturalist projects: Vireya gave us a quick slideshow showing the evolution of FNCB's iNaturalist project pages. After being set-up by Bill Elder in 2020 to enable club members to continue to share sightings in nature with each other in the era of Covid-19 lockdowns and social distancing, it now

provides a place to record any and all species found on field trips, during the Great Southern Bioblitz each year and any species within a 50km radius of Ballarat recorded by those who have joined the project. To capture the sightings of members beyond that area whilst on holidays, at a SEANA Camp or at a field trip outside of the 50km, she has also introduced a project called Members At Large. To join that project, contact Vireya via email and ask her to add your iNaturalist identity to the list of contributors: vireya@gmail.com. Many thanks to Vireya for introducing these wonderful innovations.

General Business

Sunday 4th February field trip: Estuaries of the Merri and Hopkins Rivers, Warrnambool, led by Andrew Arnold and Dr John Sherwood. Volunteer needed to write up the following for the newsletter: - Neville Oddie volunteered

Volunteers are also needed to write up

Marilyn Hewish's presentation on "Deep Time in Flinders Ranges" on 1st March, and: the Sunday 3rd March field trip to Long Forest Nature Conservation Reserve for the monthly newsletter. Please contact Emily to volunteer.

Margaret provided an update on the 300-page submission produced by John Petheram, Kevin Tolhurst and Lorraine Huddle to Heritage Victoria advocating for the Creswick Goldfields Water Distribution Precinct to be added to the State Heritage Register. An incredible report!

Vale club member Mark Bevelander and Gavin Jamieson, a local beekeeper with an extensive knowledge of Eucalypts in the area, founding member of BirdLife Ballarat and member of Ballarat Environment Network for many years.

A diverse Calendar of Activities for 2024-25 is coming together well.

The AGM is coming up next month. Please give serious consideration to the prospect of nominating to serve your club on the Committee for the next year. Committee Meetings are held via Zoom once a month on the Tuesday night ten days before each Club Meeting.

Show & Tell/ Field Reports
Les noted that January had been an unusually good month for fungi. He observed 30 species not usually seen at all in summer including four Milkcap species (*Lactarius/ Lactifluus sp.*) and four species of boletes including the Shaggy Cap *Boletellus emodensis*.

Vireya showed us four species that she had uploaded to iNaturalist in the last month. The first species was a beetle that at first glance she had thought was the fairly common Tricolor Soldier Beetle but was identified as *Australozonitis tricolor*, with only 20 previous observations on iNat. The second species was a large moth that she learned was Godart's Hawkmoth, *Agrius godarti.* This record was the first for this species in Victoria. The third species was a nymph of the mirid bug *Rayieria basifer.* The fourth species was a "horned" caterpillar resembling a stick that she had had no luck in trying to identify before she uploaded it to iNat. It was identified as a member of the *Parepisparis* genus, the only photo currently on iNat of a caterpillar from this genus. The identifier had hoped that she might have collected the caterpillar to see which species it pupated into because there is currently no data on the caterpillars of the various species of this genus, but as usual she had left it alone and wasn't able to relocate it.

John G remarked upon the explosion of Cabbage White Butterflies in the region in January, with dense clouds of them observed along the western end of Cuthberts Rd amongst other places. He found fourteen Great Crested Grebes at Lake Burrumbeet.

Emily reported the observations she had found of interest whilst following the footsteps of Bon Strange in Enfield State Forest in the township of Enfield, based on specimens Bon had sent off to the National Herbarium of Victoria several decades ago. Like Les, she found several interesting boletes, none of which were pictured in Bruce Fuhrer's Fungi of Victoria. Unusually, bird orchid leaves were found (not normally still around at this time of year) along with pods of sun orchids and caladenias and flowering Spotted Hyacinth-orchids *Dipodium pardalinum*, Rosy Hyacinth-orchids *D. roseum* and Elbow orchids, *Thynninorchis huntianus*, so tiny and well-camouflaged it always seems like a miracle to find them. An orange Studded Triangle Spider, *Arkys walckenaeri* on a Red-fruited Saw Sedge, *Gahnia sieberiana*, was another highlight. Several sightings of the critically endangered Square-tailed Kite above Clarkesdale Bird Sanctuary by campers around New Year were the first record of it at the Sanctuary.

Roger reported that he too had found some Elbow Orchids, this time in Creswick Regional Park. He also gave us a quick report on a bioblitz at Mag Dam, Snake Valley, that he and Neville had joined with the Upper Mount Emu Landcare Group earlier in the day during which Neville found a single Austral Ladies Tresses *Spiranthes australis*, a locally uncommon plant.

Judith told us the good news that a group that she has been working with at Aireys Inlet to assist their journey towards becoming a Dark Sky Community has just got the local council, Surf Coast Shire, on board, a huge step forward.

Next Meeting: Guest speaker Marilyn Hewish will present a talk titled "Deep Time in Flinders Ranges" before we hold our AGM and March Club Meeting.

When? Friday 1st March 2024, 7.30pm in person at the Federation University building at the corner of Gillies St & Gregory St, Wendouree or via Zoom if you prefer.

Meeting closed: 9.28.

SEANA Weekends
Registration forms are now available & the 2nd circular sent this week for the **SEANA Phillip Island 19th– 22nd April** weekend. Hosted by The Field Naturalist club of Victoria– FNCV.
The **SEANA Spring camp Marysville 25– 27th Oct** will be hosted by Ringwood FNC. The first information letter has now been sent out with encouragement to book accommodation

Ballarat FNC is hosting the Spring SEANA in 2025

The Moorabool Fungi Festival,2024 is to be held at Bacchus Marsh Town Hall, **23rd – 24th March**.

Our Next Club Meeting and AGM: Friday 1st March:
"DeepTime in Flinders Ranges" to be presented by Marilyn Hewish, Guest speaker. Hybrid meeting.
We ask for volunteers to write up notes on her talk and Also the Field Trip for the Newsletter please—see Emily

Arrangements for the Sunday 3rd March Field Trip-
9.30am – 4pm: Long Forest Nature Conservation Reserve, led by Marilyn Hewish, co-author of "Birds of the Long Forest 1889-2005".
Meet in the Federation University carpark on the corner of Gillies St and Gregory St for carpooling/ convoy(?) and departure at 9.30am sharp OR at the Merrimu Reservoir Picnic Ground, southern end of Diggers Rest-Coimadai Road, Coimadai at 10.30am, where we'll have morning tea whilst Marilyn gives us a quick introductory chat and look at the basic layout of Long Forest.
Toilets are available here. If possible, we might carpool further before heading to the start of Long Point Track (off Canopus Circuit) for a reasonable walk down to the creek and back.

We'll have lunch at the carpark at the start of Happy Valley Track then go for another walk along that track.
We recommend long trousers, sunsmart gear and clean, sturdy shoes. You could bring binoculars, camera, magnifying lens, field guides, morning & afternoon tea and lunch, thermos, camp chair and insect repellent.

Meetings and Excursions

Club meeting Fri March 1st AGM: Guest Speaker Marilyn Hewish
Subject *Deep Time in Flinders Ranges*
Sunday March 3rd Field trip *Long Forest Conservation area birdlife* led by Marilyn H and Emily Noble

Future events
Fri April 5th guest speaker To be confirmed
Sun April7th TBC
Volunteers needed to write up these events for our newsletter.

Next Committee meeting Tues. 26th March at 7.30 pm by Zoom

Club meetings are normally held on 1st Friday of the month at 7.30 pm at the Federation Uni Gillies St Campus (corner of Gillies and Gregory Sts, Lake Wendouree),

Website: http://fieldnatballarat.wordpress.com
Club email: ballaratfnc@gmail.com
Meetings - in person and may continue to be held via Zoom.
Members will be kept informed of arrangements each month.

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